Oliver Wendell Holmes.

ANATOMY

DESCRIPTIVE AND SURGICAL.

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BY

HENRY GRAY, F.R.S.

LECTURER ON ANATOMY AT SAINT GEORGE'S HOSPITAL.

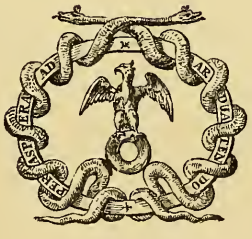
THE DRAWINGS

By H. V. CARTER, M.D.

LATE DEMONSTRATOR OF ANATOMY AT ST. GEORGE'S HOSPITAL.

THE DISSECTIONS

JOINTLY BY THE AUTHOR AND DR. CARTER.



LONDON:

JOHN W. PARKER AND SON, WEST STRAND.

1858.

LONDON
PRINTED BY WERTHEIMER AND CO.
FINSBURY CIRCUS.

TO

SIR BENJAMIN COLLINS BRODIE, BART.,

F.R.S., D.C.L.,

SERJEANT-SURGEON TO THE QUEEN,

CORRESPONDING MEMBER OF THE INSTITUTE OF FRANCE,

THIS WORK IS DEDICATED,

IN ADMIRATION OF HIS GREAT TALENTS,

AND

IN REMEMBRANCE OF MANY ACTS OF KINDNESS

SHOWN TO THE AUTHOR,

FROM AN EARLY PERIOD OF HIS PROFESSIONAL CAREER.

PREFACE.

THIS Work is intended to furnish the Student and Practitioner with an accurate view of the Anatomy of the Human Body, and more especially the application of this science to Practical Surgery.

One of the chief objects of the Author has been, to induce the Student to apply his anatomical knowledge to the more practical points in Surgery, by introducing, in small type, under each subdivision of the work, such observations as shew the necessity of an accurate knowledge of the part under examination.

Osteology. Much time and care have been devoted to this part of the work, the basis of anatomical knowledge. It contains a concise description of the anatomy of the bones, illustrated by numerous accurately-lettered engravings, shewing the various markings and processes on each bone. The attachments of each muscle are shewn in dotted lines (after the plan recently adopted by Mr. Holden), copied from recent dissections. The articulations of each bone are shewn on a new plan; and a method has been adopted, by which the hitherto complicated account of the development of the bones is made more simple.

The Articulations. In this section, the various structures forming the joints are described; a classification of the joints is given; and the anatomy of each carefully described: abundantly illustrated by engravings, all of which are taken from, or corrected by, recent dissections.

The Muscles and Fasciæ. In this section, the muscles are described in groups, as in ordinary anatomical works. A series of illustrations, shewing the lines of incision necessary in the dissection of the muscles in each region, are introduced, and the muscles are shewn in fifty-two engravings. The Surgical Anatomy of the muscles in connection with fractures, of the tendons or muscles divided in operations, is also described and illustrated.

The Arteries. The course, relations, and Surgical Anatomy of each artery are described in this section, together with the anatomy of the regions containing the arteries more especially involved in surgical operations. This part of the work is illustrated by twenty-seven engravings.

The Veins are described as in ordinary anatomical works; and illustrated by a series of engravings, shewing those in each region. The veins of the spine are described and illustrated from the well-known work of Breschet.

The Lymphatics are described, and figured in a series of illustrations copied from the elaborate work of Mascagni.

The Nervous System and Organs of Sense. A concise and accurate description of this important part of anatomy has been given, illustrated by seventy-two engravings, shewing the spinal cord and its membranes; the anatomy of the brain, in a series of sectional views; the origin, course, and distribution of the cranial, spinal, and sympathetic nerves; and the anatomy of the organs of sense.

The Viscera. A detailed description of this essential part of anatomy has been given, illustrated by fifty large, accurately-lettered engravings.

Regional Anatomy. The anatomy of the perinæum, of the ischio-rectal region, and of femoral and inguinal herniæ, is described at the end of the work; the region of the neck, the axilla, the bend of the elbow, Scarpa's triangle, and the popliteal space, in the section on the arteries; the laryngo-tracheal region, with the anatomy of the trachea and larynx. The regions are illustrated by many engravings.

Microscopical Anatomy. A brief account of the microscopical anatomy of some of the tissues, and of the various organs, has also been introduced.

The Author gratefully acknowledges the great services he has derived, in the execution of this work, from the assistance of his friend, Dr. H. V. Carter, late Demonstrator of Anatomy at St. George's Hospital. All the drawings from which the engravings were made, were executed by him. In the majority of cases, they have been copied from, or corrected by, recent dissections, made jointly by the Author and Dr. Carter.

The Author has also to thank his friend, Mr. T. Holmes, for the able assistance afforded him in correcting the proof-sheets in their passage through the press.

The engravings have been executed by Messrs. Butterworth and Heath; and the Author cannot omit thanking these gentlemen for the great care and fidelity displayed in their execution.

Wilton-Street, Belgrave-Square,
August, 1858.

From the auricle, the blood passes into the right ventricle; and from the right ventricle, through the pulmonary artery, into the lungs. The blood, arterialized by its passage through the lungs, is returned to the left side of the heart by the pulmonary veins, which open into the left auricle; from the left auricle the blood passes into the left ventricle, and from the left ventricle is distributed, by the aorta and its subdivisions, through the entire body. This constitutes the circulation of the blood in the adult.

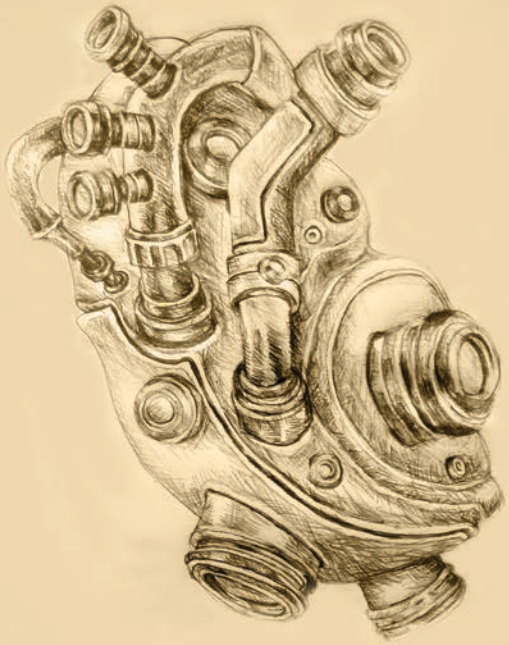
This division of the heart into four cavities, is indicated upon its surface in the form of grooves. Thus, the great transverse groove separating the auricles from the ventricles, is called the *auriculo-ventricular* groove. It is deficient, in front, from being crossed by the root of the pulmonary artery, and contains the trunk of the nutrient vessels of the heart. The auricular portion occupies the base of the heart, and is subdivided into two cavities by a median septum. The two ventricles are also separated into a right and left, by two longitudinal furrows, which are situated, one on its anterior, the other on its posterior surface: these extend from the base to the apex of the organ: the former being situated nearer to the left border of the heart, and the latter to the right. It follows, therefore, that the right ventricle forms the greater portion of the anterior surface of the heart, and the left ventricle more of its posterior surface.

Each of these cavities should now be separately examined.

The Right Auricle is a little larger than the left, its walls somewhat thinner, measuring about one line; and its cavity is capable of containing about two ounces. It consists of two parts, a principal cavity, or sinus, and an appendix auriculæ.

The *sinus* is the large quadrangular-shaped cavity, placed between the two venæ cavæ: its walls are extremely thin, and it is connected below with the right

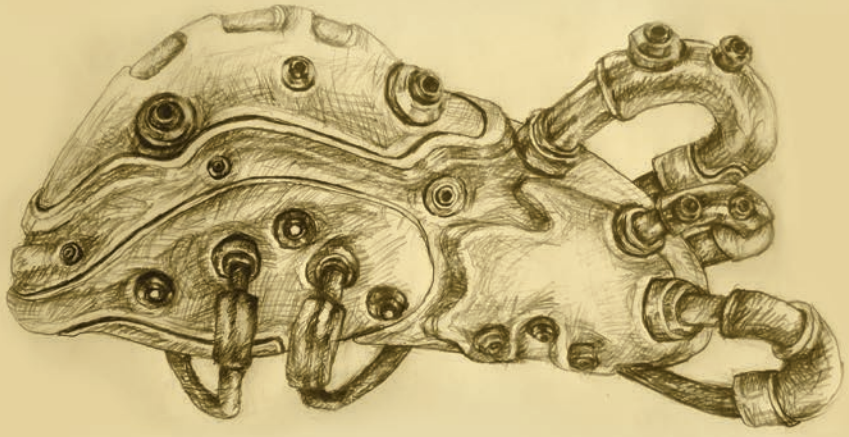
328.—The Right Auricle and Ventricle laid open, the Anterior Walls of both being removed.



ventricle, and internally, with the left auricle, being free in the rest of its extent.

Diaphragm. It is formed by the reflection of the peritoneum from the Diaphragm on to the upper and lower margins of the posterior border of the organ. The

318.—The Liver. Upper Surface.



coronary ligament consists of two layers, which are continuous on each side with the lateral ligaments; and in front, with the longitudinal ligament. Between the layers, a large oval interspace is left uncovered by peritoneum, and connected to the Diaphragm by firm areolar tissue. This space is subdivided, near its left extremity, into two parts by a deep notch (sometimes a canal), which lodges the inferior vena cava, and into which open the hepatic veins.

The *Round Ligament* is a fibrous cord, resulting from the obliteration of the umbilical vein. It ascends from the umbilicus in the anterior free margin of the longitudinal ligament, to the notch in the anterior border of the liver, from which it may be traced along the longitudinal fissure on the under surface of the liver, as far back as the inferior vena cava.

Fissures. Five fissures are seen upon the under surface of the liver, which serve to divide it into five lobes. They are the longitudinal fissure, the fissure of the ductus venosus, the transverse fissure, the fissure for the gall-bladder, and the fissure for the vena cava.

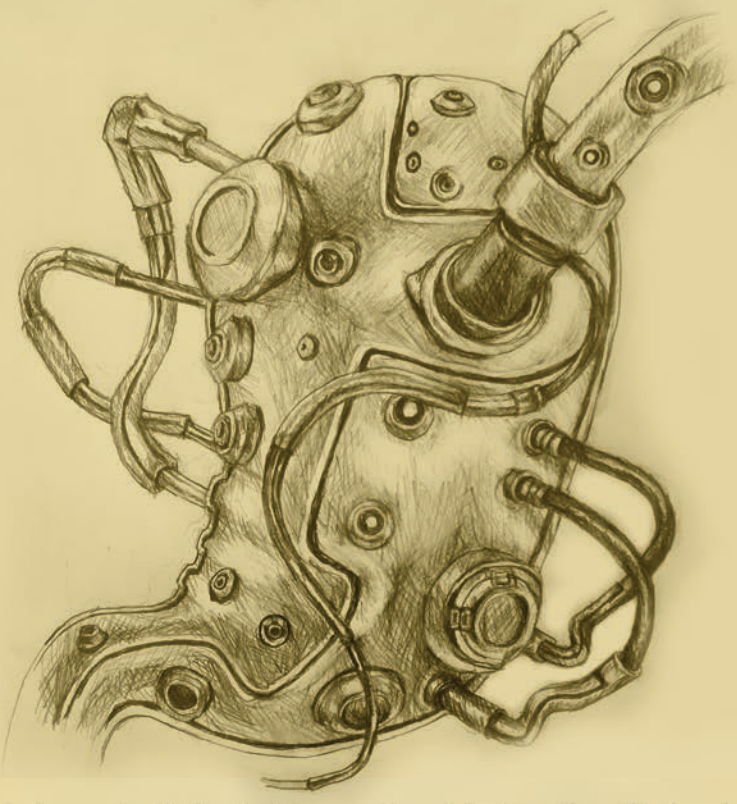
The *Longitudinal Fissure* is a deep groove, which extends from the notch on the anterior margin of the liver, to the posterior border of the organ. It separates the right and left lobes; the transverse fissure joins it, at right angles, about one-third from its posterior extremity, and divides it into two parts. The anterior half is called the *umbilical fissure:* it is deeper than the posterior part, and lodges the umbilical vein in the fœtus, or its fibrous cord (the round ligament) in the adult. This fissure is often partially bridged over by a prolongation of the hepatic substance, the *pons hepatis.*

The *Fissure of the Ductus Venosus* is the back part of the longitudinal fissure; it is shorter and shallower than the anterior portion. It lodges in the fœtus the ductus venosus, and in the adult a slender fibrous cord, the obliterated remains of that vessel.

The *Transverse*, or *Portal Fissure*, is a short but deep fissure, about two inches in length, extending transversely across the under surface of the right lobe, nearer to its posterior than its anterior border. It joins, nearly at right angles, with the longitudinal fissure. By the older anatomists, this fissure was considered the gateway (*porta*) of the liver; hence the large vein which enters

The *anterior surface* is directed upwards and forwards, and is in relation with the Diaphragm, the under surface of the left lobe of the liver, and, in the epigastric region, with the abdominal parietes.

310.—The Mucous Membrane of the Stomach and Duodenum, with the Bile Ducts.



The *posterior surface* is directed downwards and backwards, and is in relation with the pancreas and great vessels of the abdomen, the crura of the Diaphragm, and the solar plexus.

The stomach is held in position by the lesser omentum, which extends from the transverse fissure of the liver to its lesser curvature, and by a fold of peritoneum, which passes from the Diaphragm on to the œsophageal end of the stomach, the gastro-phrenic ligament; this constitutes the most fixed point of the stomach, whilst the pyloric end and greater curvature are the most moveable parts; hence, when this organ becomes greatly distended, the greater curvature is directed forwards, whilst the anterior and posterior surfaces are directed, the former upwards, and the latter downwards.

Alterations in Position. There is no organ in the body the position and connexions of which present such frequent alterations as the stomach. *During inspiration* it is displaced downwards by the descent of the Diaphragm, and elevated by the pressure of the abdominal muscles during expiration. Its position to the surrounding viscera is also changed, according to the empty or distended state of the organ. *When empty*, it occupies only a small part of the left hypochondriac region, the spleen lying behind it; the left lobe of the liver covers it in front, and the under surface of the heart rests upon it above, and in front, being separated from it by the left lobe of the liver and pericardium. Hence it is, that, in gastralgia, the pain is generally referred to the heart, and is often accompanied by palpitation and intermission of the pulse. *When the stomach is distended* the Diaphragm is forced upwards, contracting the cavity of the chest; hence the dyspnœa complained of from inspiration being impeded. The heart is also displaced upwards; hence the oppres-